

REMARKS

Applicants thank Examiner Patel for the analysis contained in the Office Action mailed September 10, 2004.

Priority Claim

Applicants thank the Examiner for noting that the priority claim has not been perfected. Applicants will file a certified copy of the Canadian priority application as soon as allowable subject matter has been confirmed.

Claim Rejection – 35 U.S.C. § 102

Claims 1 and 2 of the present application currently stand rejected as being anticipated by the Le reference (U.S. 5,199,683).

Applicants are indebted to the Examiner for having brought to their attention a potential deficiency in the claim wording. As will be hereinafter set forth in the argument which follows, the Le reference is totally incapable of functioning in the manner of the present invention. The reason for this is that seals 70 and 74 in the Le reference are performing separate and discrete sealing functions, whereas the seal groupings 22 and 32 of the present invention are performing the same sealing function, with seal grouping 32 being a redundant backup to seal grouping 22, until seal grouping 22 fails.

As the Examiner reviews the Le reference, the Examiner will note a ram shaft 34, contained in body 21, with one end exposed to the well bore chamber 18, and the other end contained in a hydraulic chamber 66. Seals 70 contained in body 21 perform a first sealing function of accomplishing separation of chamber 18 and hydraulic chamber 66 through circumferential fit about ram shaft 34.

The well bore end of the ram shaft 34 is furnished with a means for attaching ram block 48 and the hydraulic end is furnished with a piston 64. The piston 64 contains seals 72

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which perform a second sealing function of dividing hydraulic chamber 66 into two parts to allow the assembly to move when hydraulic pressure is applied to either side of piston 64.

On the opposite side of the piston 64 is a shaft extension 34a with one end fixed to the piston 64 in the hydraulic chamber 66 and the other end extending out of the chamber 64 to the atmosphere. Seals 74 contained in bodies 27 and 29 perform a third sealing function of accomplishing separation of hydraulic chamber 66 and the atmosphere through circumferential fit about shaft extension 34a.

This arrangement, as noted by the Examiner, provides two seal shafts, (shaft 34 and shaft extension 34a), that have distinct seal areas of travel and distinct seals, (70 and 74). They are, however, designed for two distinct purposes. Seal 70 engaged on shaft 34 separates well bore chamber 18 from hydraulic chamber 66 and seal 74 engaged on shaft extension 34a separates hydraulic chamber 66 from outside atmosphere. If seal 70 fails, the system fails and the blow out preventer will not operate properly. Seal 74 does not back up seal 70. It will not prevent communication of fluids between well bore chamber 18 and hydraulic chamber 66.

There are two scenarios that may occur in a situation where seal 70 fails:

- 1) If the well bore pressure in chamber 18 is zero (atmospheric), and the rams are opened hydraulically through pressure applied to hydraulic chamber 66, the hydraulic fluid will be lost into chamber 18 and flow down the well. Entire hydraulic reservoirs have been pumped down the well and lost in these cases.
- 2) If the well bore pressure is substantial and the blow out preventer is being used to contain the well by closing the rams, failed seal 70 will allow the well bore fluid to flow through the hydraulic system to the hydraulic reservoir tank. This occurrence has lead to serious explosions on both drilling and service rigs.

A uniqueness of the present invention is in the arrangement of seal 70 (Ref. Le), to prevent system failure due to well bore conditions. The applicants have not shown seal 74 in bodies 27 and 29, and seal 72 in piston 64, (Ref. Le), as part of this invention as they do not fail due to contaminants from well bore fluids. If seal 70 fails in the Le invention, immediate shut down and repair would be required before continuing and well bore fluids would not have the opportunity to cause seal 72 of piston 64 to fail and then cause seal 74 to fail.

Referring to the present invention, the two separate and distinct travel areas (30 and 40), and seal groups (22 and 32), refer to the well bore side of the piston only (the piston and shaft extension, Ref. Le, are not shown). The first travel area 30, exposed to the well bore for an extended period of time, may accumulate deposits that are difficult to remove. These deposits are usually the result of overnight shut downs where the blow out preventer is closed for safety with the ram shaft 20 extended into the well bore and exposed to well bore fluids. Seal group 22 protects the second travel area 40 and seal group 32 from the well bore deposits. When shaft 20 is moved through seal group 22 with deposits from the well bore, seal group 22 is often damaged and fails. The present invention, with failed seal group 22, will continue operate normally to finish the work on the well. This would not be the case with the seal 70 arrangements in Le.

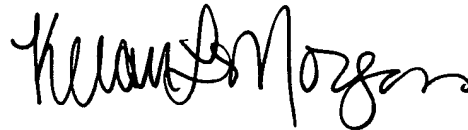
Claim 1 has been amended to specify that the second circumferential seal is performing the same sealing function as the first circumferential seal and serves as a redundant backup seal until the first circumferential seal experiences seal failure. It is respectfully submitted that this claim amendment serves to distinguish over the Le reference. With the Le reference, seals 70, 72, and 74 are serving different functions and, as such, all are necessary for the tool to function as intended. The seals 70, 72, and 74 do not back up each other. If one fails, fluids pass along the shaft from one region of the tool to another region. For example, if seal 70 fails there is fluid communication between bore chamber 18 and hydraulic chamber 66. With the present

invention, the second circumferential seal (seal group 32) is redundant in the sense it is not necessary for the tool to function as intended. It serves the same sealing function as the first circumferential seal (seal group 22) and is a backup seal that performs that sealing function should the first circumferential seal (seal group 22) fail.

In view of the foregoing amendments and arguments, it is respectfully submitted that the present application is now in a condition for allowance. Applicants, therefore, request the early issue of a Notice of Allowance.

Respectfully submitted,

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I hereby certify that this correspondence is being deposited with the U.S. Postal Service in a sealed envelope as first class mail with postage thereon fully prepaid and addressed to **Mail Stop Amendment**, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450, on the below date.

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